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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/629,815

07/30/2003

Tsutomu Ohzuku

43888-267

9492

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<sup>12/23/2009</sup>

EXAMINER

LEE, CYNTHIA K

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/23/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/629,815	<b>Applicant(s)</b> OHZUKU ET AL.	
	<b>Examiner</b> CYNTHIA LEE	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,14 and 16-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,14 and 16-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/23/2009 has been entered.

***Response to Amendment***

This Office Action is responsive to the arguments and the declaration filed on 11/23/2009. Claims 1, 3-9, 14, 16-18 are pending.

Applicant's arguments have been considered. Claims 1, 3-9, 14, 16-18 are non-finally rejected for reasons stated herein below.

***Information Disclosure Statement***

The Information Disclosure Statement (IDS) filed 10/21/2009 and 12/14/2009 have been placed in the application file and the information referred to therein has been considered.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-8, 14, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohzuku (Layered Lithium Insertion Material of  $\text{LiCo}_{1/3}\text{Ni}_{1/3}\text{Mn}_{1/3}\text{O}_2$  for Lithium-Ion Batteries, Chemistry Letters 2001, the Chemical Society of Japan, pgs 642-643, CL-010390) in view of Ohzuku (JP 2002-042813, relying upon the English equivalent US 6551744 for translation).

Ohzuku '390 discloses a positive electrode material comprising the formula  $\text{LiCo}_{1/3}\text{Ni}_{1/3}\text{Mn}_{1/3}\text{O}_2$  (see Abstract).

Ohzuku '390 does not expressly disclose the crystal structure of the above formula as claimed by the Applicants in claims 1, 3, 4 and 6-8. The Examiner notes that while the prior art does not explicitly teach these properties, these are considered inherent in the prior art barring any differences shown by objective evidence between the positive electrode material disclosed in the prior art and the applicant. As the positive active material taught by the prior art and the applicant are identical within the scope of claims, 1, 3, 4, 6-8, Ohzuku '390 inherently teaches the crystalline properties as claimed by the Applicants. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01.

When the Examiner has provided a sound bases for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the

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applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Ohzuku '390 does not disclose that the nickel, manganese, and cobalt elements are uniformly dispersed at the atomic level (Applicant's claim 1). Ohzuku '813 teaches of making a metal oxide as positive electrode materials by coprecipitation method. Coprecipitation is a technique for obtaining a composite hydroxide by simultaneously precipitating two different elements in an aqueous solution utilizing a neutralization reaction. Until now, the conventional coprecipitation process sufficed for the purpose, since only a portion of the nickel had to be replaced by a small amount of other element. However, if nickel element and manganese element are to be incorporated in substantially the same amounts to form a solid solution at the atomic level, as in the present invention, the conventional method cannot serve the purpose and more advanced techniques are required. Further, when the intended lithium-containing composite oxide is obtained by causing a hydroxide obtained by precipitation to react with lithium, a large difference occurs in the electrochemical properties depending on the particle shape when the oxide is used for a battery. With the conventional method, it is difficult to control the difference (6:53-7:10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the metal oxide of Ohzuku '390 by the coprecipitation method for the benefit of controlling the difference in the electrochemical properties of the metal compounds.

It is noted that Applicants also use the coprecipitation method to produce positive electrode material. The instant Specification pg 24 states that:

“First, the coprecipitation in step (a) is the method primarily to obtain a composite hydroxide by simultaneously coprecipitating a plurality of elements in an aqueous solution through neutralization reaction. In the case of using nickel, manganese and cobalt, since manganese is prone to be oxidized, manganese is sufficiently oxidized into trivalent manganese ions even by a trace amount of dissolved oxygen present in the aqueous solution. As a result, its dispersion and formation of solid solution at the atomic level is insufficient. The point of this step is to produce a double hydroxide or triple hydroxide by allowing nickel, manganese and cobalt elements to be present in one layered hydroxide without separation.” (emphasis added)

Thus, the forming the positive electrode material using the coprecipitation method of Ohzuku '813 inherently forms nickel, manganese, and cobalt elements being “uniformly dispersed at the atomic level” as claimed by Applicants in claim 1.

Regarding claim 14, Ohzuku '390 discloses a  $\text{LiCo}_{1/3}\text{Ni}_{1/3}\text{Mn}_{1/3}\text{O}_2$  electrode, but does not disclose a negative electrode material capable of absorbing and desorbing lithium ions and/or metal lithium and an electrolyte. Ohzuku '813 teaches a negative electrode material capable of absorbing and desorbing lithium ions (14:58-60) and an electrolyte (17:26-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a negative electrode material capable of absorbing and desorbing lithium ions and/or metal lithium and an electrolyte to the positive electrode material of Ohzuku '390 for the benefit of generating electrical power.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohzuku (Layered Lithium Insertion Material of  $\text{LiCo}_{1/3}\text{Ni}_{1/3}\text{Mn}_{1/3}\text{O}_2$  for Lithium-Ion Batteries, Chemistry Letters 2001, the Chemical Society of Japan, pgs 642-643, CL-010390) in view of Ohzuku (JP 2002-042813, relying upon the English equivalent US 6551744 for translation) as applied to claim 1 above, and further in view of Miyasaka (US 6416902).

Ohzuku '390 modified by Ohzuku '813 teaches particles but does not disclose primary particles and secondary particles as claimed in Applicant's claim 9. However, Miyasaka discloses a lithium ion battery comprising a positive electrode with a mean grain size in the range of 3 to 15  $\mu\text{m}$  for secondary particles and in the range of 0.1 to 0.5  $\mu\text{m}$  for primary particles. The term secondary particle means a particle consisting of aggregated primary particles (5:48-57). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have primary and secondary particles as taught by Miyasaka in the particles of Ohzuku '390 modified by Ohzuku '813 for the benefit of packing the primary particles between the secondary particles. It is noted that primary particles will be able to occupy void spaces between the secondary particles, and hence minimize void spaces.

### ***Response to Arguments***

Applicant's arguments and the declaration filed 11/23/2009 regarding the non-uniform dispersion of cobalt, nickel, and manganese in Ohzuku ('390) have been fully considered and are found persuasive.

The Examiner agrees with the Applicant that the presence of the separate peak due to  $\text{LiCoO}_2$  in Ohzuku CL-010390 evidences the non-uniform distribution of cobalt in the metal oxide. The Examiner further agrees that the presence of red spots symbolizing high concentration of cobalt indicates the presence of non-uniform distribution in the metal oxide. The color micrographs of the present invention and the prior art have been submitted on 2/20/2007 and have been examined by the Examiner. As a result, the 102/103 rejection of Ohzuku CL-010390 has been withdrawn.

*Applicant argues that Ohzuku et al. (JP '813) do not disclose forming the three transition metal composite oxide. Ohzuku et al. (JP '813) do not teach that the composite metal oxide includes Co, as required by claim 1. Pg. 7 of Arguments.*

In response, Ohzuku ('390) discloses forming the three transition metal composite oxide that includes Co. See rejection above.

*Regarding primary and secondary particles, Applicant argues that there are not two different distributions of particles, as asserted by the Examiner. Rather, a plurality of primary particles of a first size together form a secondary particle of a second larger size. Pg 8 and 9 of Response.*

In response, Miyasaka teaches that the term secondary particle means a particle consisting of aggregated primary particles. See rejection above.

### **Conclusion**



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/  
Examiner, Art Unit 1795